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20 September 1968

MEMORANDUM FOR: NRO Consultant to ICRS

ATTENTION : [redacted] 25X1A

SUBJECT : J-3 Short Arc Experiment

1. As concurred in by the ICRS at the 17 September 1968 meeting, the attached letter to NPIC has been forwarded. It levys certain requirements on NPIC which are dependent on specific orbital data which must be developed by the NRO and which is described in the attached memorandum.

2. Please advise if any further information or clarification is required. It is recommended you coordinate with the Chief, Requirements Division, PPBS/NPIC ([redacted]) before you proceed with orbit design in the event there would be any unique information NPIC might require. 25X1A

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Deputy Chairman
Imagery Collection Requirements
Subcommittee

Attachment: a/s

NRO review(s) completed.

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WORKING PAPER

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19 September 1968

MEMORANDUM FOR: Chief, Requirements Division, PPBS/NPIC

SUBJECT : Effect of Short-Arc Technique Experiment on Intelligence Requirements

1. A proposal by the Mapping, Charting and Geodesy Working Group to utilize the independent operating Dual Independent Stellar Index Camera (DISIC) system of the KH-4B for geodetic positioning of targets through the short-arc technique, was not concurred in by COMIREX for CORONA Mission 1104. The short-arc technique is a method for utilizing the satellite ephemeris to extend from known ground geodetic control areas to the area of the required targets and then again to an area of known control. The ephemeris is adjusted to fit the geodetic ground control which is photographed from these portions of the arc. Several intersecting passes are then reduced simultaneously to form a geometric network over the desired targeting area.

2. In order to accomplish the above it is required that the mission be launched either earlier or later than the normal time so as to provide acceptable lighting conditions on the ascending side of the orbit - depending on type of orbit flown. This would result in a reduction of available solar illumination during the descending portion of the orbit on which intelligence requirements are programmed. This lower solar elevation requires more exposure than would be required under nominal KH-4B operating conditions.

3. Although the primary reason for denying the MC&G request for the short-arc experiment on 1104 was overriding intelligence requirements, one of the contributing factors was lack of general understanding within the COMIREX and its subcommittees of what the actual detrimental effect would be, to the

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intelligence mission, as a result of the reduced solar illumination. This was especially true of the members of the ICRS who had very little factual information on which to base a recommendation to the COMIREX.

4. Although denying permission for use of the short-arc technique for Mission 1104, the COMIREX recommended that preparation of a proposal for such a mission in the June 1969 time period be prepared. It is anticipated that this proposal will be considered next Spring. In this regard, the ICRS must evaluate the effects on the primary mission and prepare an appropriate recommendation to the COMIREX. Consequently, the NRO/SOC has been requested to develop a specific KH-4B (J-3) orbit designed to employ the short-arc technique and acquire photography of the required targets. It is requested that the NPIC, utilizing the data to be provided by NRO/SOC, prepare an analysis of this mission - as to reduce solar illumination effects/larger slit width - on intelligence photo interpretation - and provide a report to the ICRS by 1 April 1969 which incorporates the following information: (Data on all major target categories should be included and specific comparison between a nominal mission and the special mission in terms of photo interpretation should be made).

a. Estimate of the probability and degree of satisfying the intelligence requirements by the special mission.

b. Effects:

(1) What effect on overall image interpretation can be expected, in terms of resolution degradation, as a result of special mission parameters.

(2) What effect on photo interpretation does this have in terms of shadow obscuration, haze, etc.

(3) Effect on ground, air and naval order of battle classification and count.

(4) Effect on USSR/China search requirements.

(5) Effect of film processing levels, to compensate for lower solar elevation, on NPIC photo interpretation, reproduction, etc.

(6) Any other detrimental or beneficial area that should be considered.

5. The above analysis applies to the KH-4B (J-3) system only. Please feel free to ask for additional information or clarification, if necessary.

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Deputy Chairman
Imagery Collection Requirements
Subcommittee